



## **Generation Interconnection**

# **Combined Feasibility / System Impact Study Report**

**for**

**Queue Project AF2-131**

**COOPER 34.5 KV**

**3 MW Capacity / 5 MW Energy**

July 2020

# Table of Contents

1	Introduction.....	3
2	Preface.....	3
3	General.....	4
4	Point of Interconnection.....	4
5	Cost Summary.....	4
6	Transmission Owner Scope of Work.....	4
7	Interconnection Customer Requirements.....	5
8	Revenue Metering and SCADA Requirements.....	5
8.1	PJM Requirements.....	5
8.2	Meteorological Data Reporting Requirements.....	5
8.3	Interconnected Transmission Owner Requirements.....	5
9	Summer Peak Analysis.....	6
9.1	Generation Deliverability.....	6
9.2	Multiple Facility Contingency.....	6
9.3	Contribution to Previously Identified Overloads.....	6
9.4	Steady-State Voltage Requirements.....	6
9.5	Potential Congestion due to Local Energy Deliverability.....	6
10	Light Load Analysis.....	6
11	Stability and Reactive Power Analysis.....	7
12	Short Circuit Analysis.....	7
13	Affected Systems.....	7
14	Attachment 1: One Line Diagram.....	8

## 1 Introduction

This Combined Feasibility/System Impact Study has been prepared in accordance with the PJM Open Access Transmission Tariff, 205, as well as the System Impact Study Agreement between the Interconnection Customer (IC), and PJM Interconnection, LLC (PJM), Transmission Provider (TP). The Interconnected Transmission Owner (ITO) is PECO.

## 2 Preface

The intent of the System Impact Study is to determine a plan, with approximate cost and construction time estimates, to connect the subject generation interconnection project to the PJM network at a location specified by the Interconnection Customer. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system. All facilities required for interconnection of a generation interconnection project must be designed to meet the technical specifications (on PJM web site) for the appropriate transmission owner.

In some instances an Interconnection Customer may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection or merchant transmission upgrade, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the Feasibility Study, but the actual allocation will be deferred until the System Impact Study is performed.

The System Impact Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

The Interconnection Customer seeking to interconnect a wind or solar generation facility shall maintain meteorological data facilities as well as provide that meteorological data which is required per Schedule H to the Interconnection Service Agreement and Section 8 of Manual 14D.

### 3 General

The Interconnection Customer (IC), **Ironwood Projects, LLC**, has proposed a Solar generating facility located in York County, Pennsylvania. The installed facilities will have a total capability of 5 MW with 3 MW of this output being recognized by PJM as Capacity. The proposed in-service date for this project is June 01, 2022. This study does not imply a TO commitment to this in-service date.

<b>Queue Number</b>	<b>AF2-131</b>
<b>Project Name</b>	COOPER 34.5 KV
<b>State</b>	Pennsylvania
<b>County</b>	York
<b>Transmission Owner</b>	PECO
<b>MFO</b>	5
<b>MWE</b>	5
<b>MWC</b>	3
<b>Fuel</b>	Solar
<b>Basecase Study Year</b>	2023

Any new service customers who can feasibly be commercially operable prior to June 1st of the basecase study year are required to request interim deliverability analysis.

### 4 Point of Interconnection

AF2-131 will interconnect with the PECO distribution system via the Cooper 34.5 kV circuit 353.

### 5 Cost Summary

The AF2-131 project will be responsible for the following costs:

<b>Description</b>	<b>Total Cost</b>
Total Physical Interconnection Costs	\$1,260,000
Allocation towards System Network Upgrade Costs	\$0
<b>Total Costs</b>	<b>\$1,260,000</b>

This cost excludes a CIAC Tax Gross Up charges.

### 6 Transmission Owner Scope of Work

The AF2-131 project will interconnect to the PJM system via a non-FERC jurisdictional distribution circuit. Detailed scope, cost, and schedule will be provided in a separate two party Interconnection Agreement (IA) between PECO and the Interconnection Customer.

AF2-131 was estimated as a Generating Facility connected to the Cooper 353 34kV distribution circuit. A preliminary cost and schedule estimate is provided below:

Estimated total cost for the physical interconnection: **\$1,260,000**

Estimated schedule duration: **24 months**

## 7 Interconnection Customer Requirements

The Interconnection Customer facilities must be designed in accordance with the “Exelon Utilities Transmission Facility Interconnection Requirements” document dated January 1, 2016. This document is located at the following link:

<http://www.pjm.com/~media/planning/plan-standards/private-ce/exelon-utilities-transmission-facility-interconnection-requirements.ashx>

## 8 Revenue Metering and SCADA Requirements

### 8.1 PJM Requirements

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Section 8 of Attachment O.

### 8.2 Meteorological Data Reporting Requirements

The solar generation facility shall provide the Transmission Provider with site-specific meteorological data including:

- Temperature (degrees Fahrenheit)
- Atmospheric pressure (hectopascals)
- Irradiance
- Forced outage data

### 8.3 Interconnected Transmission Owner Requirements

The IC will be required to comply with all Interconnected Transmission Owner's revenue metering requirements for generation interconnection customers located at the following link:

<http://www.pjm.com/planning/design-engineering/to-tech-standards/>

## 9 Summer Peak Analysis

The Queue Project AF2-131 was evaluated as a 5.0 MW (Capacity 3.0 MW) injection at the **Cooper 34.5 kV substation** in the PECO area. Project AF2-131 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AF2-131 was studied with a commercial probability of 100.0 %. Potential network impacts were as follows:

### 9.1 Generation Deliverability

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

### 9.2 Multiple Facility Contingency

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

### 9.3 Contribution to Previously Identified Overloads

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

### 9.4 Steady-State Voltage Requirements

None

### 9.5 Potential Congestion due to Local Energy Deliverability

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

None

## 10 Light Load Analysis

Not required

## **11 Stability and Reactive Power Analysis**

No impacts were identified

## **12 Short Circuit Analysis**

The following circuits are over-duty:

None

## **13 Affected Systems**

No impacts were identified

# 14 Attachment 1: One Line Diagram

